
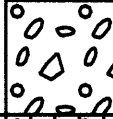
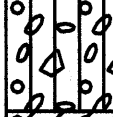

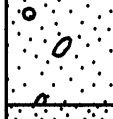


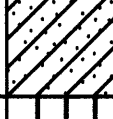
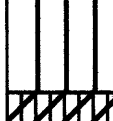
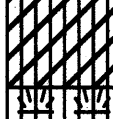

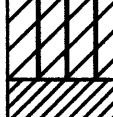
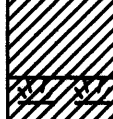










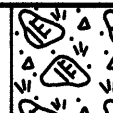

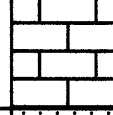
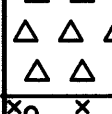
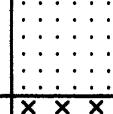

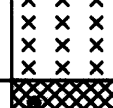
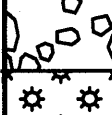




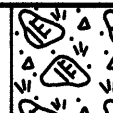

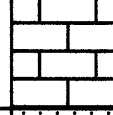
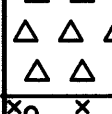
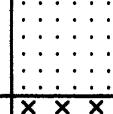

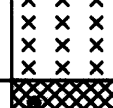
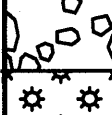




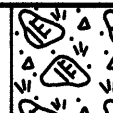

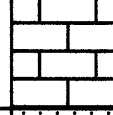
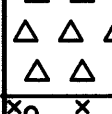
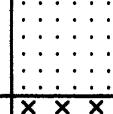

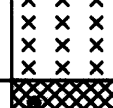
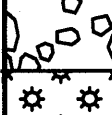



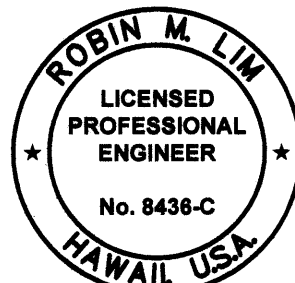
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		Geotechnical Engineering				
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)						
MAJOR DIVISIONS			USCS	TYPICAL DESCRIPTIONS		
COARSE-GRAINED SOILS	GRAVELS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
		LESS THAN 5% FINES		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	
	SANDS	CLEAN SANDS		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	
		LESS THAN 5% FINES		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		50% OR MORE OF COARSE FRACTION PASSING THROUGH NO. 4 SIEVE		SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
FINE-GRAINED SOILS	SANDS	SANDS WITH FINES		SM	SILTY SANDS, SAND-SILT MIXTURES	
		MORE THAN 12% FINES		SC	CLAYEY SANDS, SAND-CLAY MIXTURES	
		SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
	SILTS AND CLAYS		LIQUID LIMIT 50 OR MORE		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE		OL
		SILTS AND CLAYS		LIQUID LIMIT 50 OR MORE		MH
SILTS AND CLAYS	LIQUID LIMIT 50 OR MORE				CH	INORGANIC CLAYS OF HIGH PLASTICITY
	SILTS AND CLAYS		LIQUID LIMIT 50 OR MORE		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
		HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS						
LEGEND						
	(2-INCH) O.D. STANDARD PENETRATION TEST	LL	LIQUID LIMIT (NP=NON-PLASTIC)			
	(3-INCH) O.D. MODIFIED CALIFORNIA SAMPLE	PI	PLASTICITY INDEX (NP=NON-PLASTIC)			
	SHELBY TUBE SAMPLE	TV	TORVANE SHEAR (tsf)			
	GRAB SAMPLE	PEN	POCKET PENETROMETER (tsf)			
	CORE SAMPLE	UC	UNCONFINED COMPRESSION (psi)			
	WATER LEVEL OBSERVED IN BORING	UU	UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (ksf)			
			Plate A-0.1			

	<div>GEOLABS, INC.</div> <div>Geotechnical Engineering</div>	<div>Rock Log Legend</div>																								
<div>ROCK DESCRIPTIONS</div> <table><tr><td></td><td>BASALT</td><td></td><td>FINGER CORAL</td></tr><tr><td></td><td>BOULDERS</td><td></td><td>LIMESTONE</td></tr><tr><td></td><td>BRECCIA</td><td></td><td>SANDSTONE</td></tr><tr><td></td><td>CLINKER</td><td></td><td>SILTSTONE</td></tr><tr><td></td><td>COBBLES</td><td></td><td>TUFF</td></tr><tr><td></td><td>CORAL</td><td></td><td>VOID/CAVITY</td></tr></table>				BASALT		FINGER CORAL		BOULDERS		LIMESTONE		BRECCIA		SANDSTONE		CLINKER		SILTSTONE		COBBLES		TUFF		CORAL		VOID/CAVITY
	BASALT		FINGER CORAL																							
	BOULDERS		LIMESTONE																							
	BRECCIA		SANDSTONE																							
	CLINKER		SILTSTONE																							
	COBBLES		TUFF																							
	CORAL		VOID/CAVITY																							
<div>ROCK DESCRIPTION SYSTEM</div> <div>ROCK FRACTURE CHARACTERISTICS</div> <div>The following terms describe general fracture spacing of a rock:</div> <div><div>Massive:</div><div>Greater than 24 inches apart</div><div>Slightly Fractured:</div><div>12 to 24 inches apart</div><div>Moderately Fractured:</div><div>6 to 12 inches apart</div><div>Closely Fractured:</div><div>3 to 6 inches apart</div><div>Severely Fractured:</div><div>Less than 3 inches apart</div></div> <div>DEGREE OF WEATHERING</div> <div>The following terms describe the chemical weathering of a rock:</div> <div><div>Unweathered:</div><div>Rock shows no sign of discoloration or loss of strength.</div><div>Slightly Weathered:</div><div>Slight discoloration inwards from open fractures.</div><div>Moderately Weathered:</div><div>Discoloration throughout and noticeably weakened though not able to break by hand.</div><div>Highly Weathered:</div><div>Most minerals decomposed with some corestones present in residual soil mass. Can be broken by hand.</div><div>Extremely Weathered:</div><div>Saprolite. Mineral residue completely decomposed to soil but fabric and structure preserved.</div></div> <div>HARDNESS</div> <div>The following terms describe the resistance of a rock to indentation or scratching:</div> <div><div>Very Hard:</div><div>Specimen breaks with difficulty after several "pinging" hammer blows. Example: Dense, fine grain volcanic rock</div><div>Hard:</div><div>Specimen breaks with some difficulty after several hammer blows. Example: Vesicular, vugular, coarse-grained rock</div><div>Medium Hard:</div><div>Specimen can be broked by one hammer blow. Cannot be scraped by knife. SPT may penetrate by ~25 blows per inch with bounce. Example: Porous rock such as clinker, cinder, and coral reef</div><div>Soft:</div><div>Can be indented by one hammer blow. Can be scraped or peeled by knife. SPT can penetrate by ~100 blows per foot. Example: Weathered rock, chalk-like coral reef</div><div>Very Soft:</div><div>Crumbles under hammer blow. Can be peeled and carved by knife. Can be indented by finger pressure. Example: Saprolite</div></div> <div>Plate A-0.2</div>																										

LOG LEGEND FOR ROCK 6125-00.GPJ GEOLABS.GDT 7/29/09

GEOTECHNICAL NOTES




1. A geotechnical engineering report entitled "Preliminary Geotechnical Assessment, Emergency Earthquake Repairs," dated February 27, 2009 has been prepared by Geolabs, Inc. A copy of the report is on file at the office of the Engineer for review by the Contractor.
2. For boring locations, see Sheets 20, 22, 26, & 41.
3. The information presented in the logs of borings depict the subsurface conditions encountered at that specified location and at the time of the field exploration only. Variations of subsoil conditions from those depicted in the logs of borings may occur between and beyond the borings.
4. The penetration resistance shown on the logs of borings indicate the number of blows required for the specific sampler type used. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.
5. The data given is for general information only. Bidders shall examine the site and the boring data and draw their own conclusions therefrom as to the character of materials to be encountered. The Engineer will not assume responsibility for variations of subsoil quality or conditions other than at the boring locations shown and at the time the borings were taken.












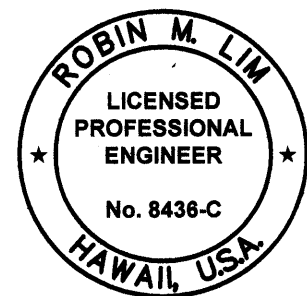
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS DEFINED IN CHAPTER 18-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."

[Signature] 4/30/10
SIGNATURE DATE
GEOLABS, INC. LIC. EXPIRATION

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-15(19)	2009	53	59

 GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAI'I, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)								Log of Boring 1	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 440 *	
Sieve	1				8				GW	5-inch ASPHALTIC CONCRETE	
	1				26		5		GM	13-inch BASE COURSE	
										Brown to gray SILTY GRAVEL with sand and cobbles, loose, damp (fill) grades to medium dense	
	8		92		21		10			Brown to gray BOULDERS AND COBBLES with sand and silt, dense, damp (rockfill)	
			74				15				
			83				20				
			68	13			25			Gray vugular BASALT, moderately fractured, unweathered to slightly weathered, hard to very hard (a'a basalt)	
			72	17				30		Brownish gray BASALT, closely fractured, moderately weathered, soft to medium hard (a'a basalt)	
										Boring terminated at 30 feet	
								35			* Elevations estimated from SSFM International, Inc. on 1/13/2009.
							40				
							45				
							50				
							55				
							60				
							65				
							70				
							75				
Date Started: February 10, 2009										Water Level: \nexists Not Encountered	
Date Completed: February 10, 2009											
Logged By: S. Latronic										Drill Rig: MOBILE B-53	
Total Depth: 30 feet										Drilling Method: 4" Auger & HQ Coring	
Work Order: 6125-00										Driving Energy: 140 lb. wt., 30 in. drop	

		GEOLABS, INC. Geotechnical Engineering					EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)					Log of Boring 2	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 438 *			
										Description			
Sieve	4				15				SM	5-inch ASPHALTIC CONCRETE			
			17		20/0" Ref.		5			Grayish brown SAND with some gravel and silt, medium dense, dry to damp (fill) grades with cobbles			
	4		67		47		10			Gray BOULDERS AND COBBLES with sand and traces of silt, dense, damp (fill)			
			48				15						
			30				20						
			45	23	20/0" Ref.		25			Gray vugular BASALT, moderately to closely fractured, slightly weathered, hard (a'a basalt)			
			0				30			Grayish brown GRAVEL AND COBBLES (BASALTIC) with sand and silt, dense, damp (clinker)			
	22				37/6" +25/3" Ref.		35			Gray BASALT, closely fractured, moderately weathered, soft to medium hard (a'a basalt)			
							40			Boring terminated at 32.8 feet			
							45						
						50							
						55							
						60							
						65							
						70							
						75							
Date Started: February 10, 2009									Water Level: \nexists Not Encountered				
Date Completed: February 10, 2009													
Logged By: S. Latronic									Drill Rig: MOBILE B-53				
Total Depth: 32.8 feet									Drilling Method: 4" Auger & HQ Coring				
Work Order: 6125-00									Driving Energy: 140 lb. wt., 30 in. drop				



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SIGNATURE J.C. EXPIRATION
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG - 1

EMERGENCY EARTHQUAKE ROCKFALL REPAIRS


Various Locations on Hawaii'i, Unit 1


Federal Aid Project No. ER-15(19)

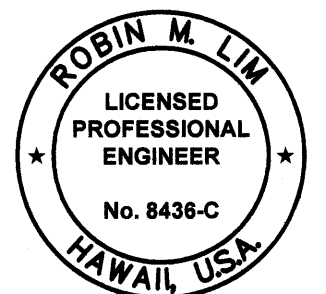
Scale: AS NOTED Date: December 18, 2009

SHEET No. 2 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-15(19)	2009	54	59

	GEOLABS, INC.		EMERGENCY EARTHQUAKE REPAIRS										Log of Boring	
	Geotechnical Engineering		VARIOUS LOCATIONS ON HAWAII, UNIT 1										3	
		FEDERAL AID PROJECT NO. ER-15(19)												
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 3390 *				
										Description				
Sieve	9				28				SM	3.5-inch ASPHALTIC CONCRETE				
	17				8				ML	Tannish white SILTY SAND with gravel, dense, damp (fill)				
	14				8	0.5	5			Brown to gray GRAVELLY SILT with sand, medium stiff, damp (fill)				
	21	79			43		10			grades with more gravel				
	30				7		15		ML	Brown SILT with some gravel and occasional cobbles, soft to medium stiff, damp to moist (volcanic ash)				
	24	81			51		20			grades to very stiff with more gravel				
8			65	15	20		25			Gray BASALT, closely fractured, slightly to moderately weathered, medium hard (welded clinker)				
			67	11			30							
							35			Boring terminated at 35 feet				
							40							
							45							
							50							
							55							
							60							
							65							
							70							
							75							
Date Started:		February 9, 2009				Water Level: ±		Not Encountered						
Date Completed:		February 9, 2009				Drill Rig:		MOBILE B-53						
Logged By:		S. Latronic				Drilling Method:		4" Auger & HQ Coring						
Total Depth:		35 feet				Driving Energy:		140 lb. wt., 30 in. drop						
Work Order:		6125-00												

	GEOLABS, INC.		EMERGENCY EARTHQUAKE REPAIRS										Log of Boring	
	Geotechnical Engineering		VARIOUS LOCATIONS ON HAWAII, UNIT 1										4	
		FEDERAL AID PROJECT NO. ER-15(19)												
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 3388 *				
										Description				
Direct Shear	25	79			30	1.5			SM	3-inch ASPHALTIC CONCRETE				
	14				10				ML	Tannish white SILTY SAND with gravel, medium dense, damp (fill)				
	30	62			23	0.8	5			Brown SILT with gravel and sand, stiff, damp (fill)				
	19				11		10							
	80	45			8	1.0	15		MH	Orange-brown CLAYEY SILT, stiff, moist (volcanic ash)				
	85				2	0.5	20			grades to very soft				
LL=75 PI=17	43	74	20		46	>4.5	25		MH	Brown CLAYEY SILT, very stiff, damp (weathered clinker)				
							30			grades with gravel and cobbles (basaltic)				
			17		20/0" Ref.		35		MH	Reddish gray CLAYEY SILT with cobbles and gravel (basaltic), very stiff, damp (weathered clinker)				
			64	10	25/0" Ref.		40			Gray BASALT, severely fractured, moderately weathered, medium hard to hard (a'a basalt)				
							45							
							50							
							55							
							60							
							65							
							70							
							75							
Date Started:		February 3, 2009				Water Level: ±		Not Encountered						
Date Completed:		February 3, 2009				Drill Rig:		MOBILE B-53						
Logged By:		S. Latronic				Drilling Method:		4" Auger & HQ Coring						
Total Depth:		35 feet				Driving Energy:		140 lb. wt., 30 in. drop						
Work Order:		6125-00												





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[Signature] 2/30/10
SIGNATURE LIC. EXPIRATION
GEOLABS, INC.

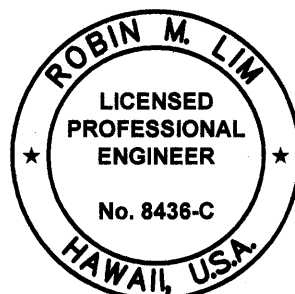
STATE OF HAWAII	
DEPARTMENT OF TRANSPORTATION	
HIGHWAYS DIVISION	
<u>BORING LOG - 2</u>	
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS	
Various Locations on Hawai'i, Unit 1	
Federal Aid Project No. ER-15(19)	
Scale: AS NOTED	Date: December 18, 2009
SHEET No. 3 OF 7 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-15(19)	2009	55	59

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 5	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 3386 *					
	Description														
	15				16				SM	3-inch ASPHALTIC CONCRETE					
	13				17				ML	Tannish white SILTY SAND with gravel, medium dense, damp (fill)					
	21	75			8	1.0	5			Grayish brown GRAVELLY SILT, stiff, damp (fill)					
	26				10					grades to reddish brown					
					11	1.0	10		ML	Brown SILT with gravel and cobbles, stiff, damp (volcanic ash/clinker)					
	29	78			25	1.0	15								
	39				14		20			Brownish gray COBBLES AND GRAVEL (BASALTIC) with sand and silt, medium dense, damp (clinker)					
	7	95	20		29		25								
			75	25	25/0" Ref.		30								
							35			Gray vugular BASALT, moderately fractured, unweathered, hard (a'a basalt)					
							40			Boring terminated at 36.5 feet					
							45								
							50								
							55								
							60								
							65								
							70								
							75								
Date Started: February 3, 2009										Water Level: x		Not Encountered			
Date Completed: February 3, 2009															
Logged By: S. Latronic										Drill Rig:		MOBILE B-53			
Total Depth: 36.5 feet										Drilling Method:		4" Auger & HQ Coring			
Work Order: 6125-00										Driving Energy:		140 lb. wt., 30 in. drop			

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 6	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 108 *					
	Description														
	11		50		50/5" Ref.				MH	5.5-inch ASPHALTIC CONCRETE					
							5			Brown CLAYEY SILT with gravel, very stiff, moist (fill)					
			60							Gray BOULDERS, COBBLES, AND GRAVEL (BASALTIC) with some brown silt, dense, dry (fill)					
			75				10			grades with no boulders					
										Gray COBBLES AND GRAVEL (BASALTIC) with sand and traces of clayey silt, medium dense to dense, damp (clinker and volcanic ash)					
							15			Gray vugular BASALT, moderately fractured, unweathered, very hard					
							20			Boring terminated at 16.5 feet					
							25								
							30								
							35								
							40								
							45								
							50								
							55								
							60								
							65								
							70								
							75								
Date Started: February 6, 2009										Water Level: x		Not Encountered			
Date Completed: February 6, 2009															
Logged By: S. Latronic										Drill Rig:		MOBILE B-53			
Total Depth: 16.5 feet										Drilling Method:		4" Auger & HQ Coring			
Work Order: 6125-00										Driving Energy:		140 lb. wt., 30 in. drop			

SURVEY PLOTTED BY	DATE
DESIGNED BY	
NOTED BY	
CHECKED BY	





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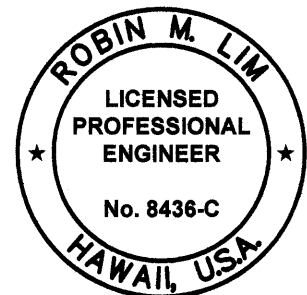
Robin M. Lim
SIGNATURE LIC. EXPIRATION 12/30/10
GEOLABS, INC.

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<u>BORING LOG - 3</u>	
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS	
Various Locations on Hawai'i, Unit 1	
Federal Aid Project No. ER-15(19)	
Scale: AS NOTED	Date: December 18, 2009
SHEET No. 4 OF 7 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-15(19)	2009	56	59

	GEOLABS, INC.		EMERGENCY EARTHQUAKE REPAIRS										Log of Boring	
	Geotechnical Engineering		VARIOUS LOCATIONS ON HAWAII, UNIT 1										7	
		FEDERAL AID PROJECT NO. ER-15(19)												
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 108 *				
										Description				
Sieve			28		21				GW	6-inch ASPHALTIC CONCRETE				
	11						5		GW	Gray and white SANDY GRAVEL with traces of silt, very dense, damp (fill)				
			33				10			Brown to gray BOULDERS, COBBLES, AND GRAVEL with sand and traces of brown silt, dense, dry (fill)				
	12		92	38	50/2" Ref.		15			Brown/gray SILTY GRAVEL with some sand and cobbles, medium dense, damp (fill)				
							20			Grayish brown COBBLES AND GRAVEL (BASALTIC) with traces of sand and silt, loose to medium dense, damp (clinker and volcanic ash)				
							25			Brownish gray vugular BASALT, moderately fractured, slightly to moderately weathered, hard to very hard				
							30			Boring terminated at 16.5 feet				
							35							
							40							
							45							
						50								
						55								
						60								
						65								
						70								
						75								
Date Started:		February 6, 2009				Water Level: \pm		Not Encountered						
Date Completed:		February 6, 2009				Drill Rig:		MOBILE B-53						
Logged By:		S. Latronic				Drilling Method:		4" Auger & HQ Coring						
Total Depth:		16.5 feet				Driving Energy:		140 lb. wt., 30 in. drop						
Work Order:		6125-00												

	GEOLABS, INC.		EMERGENCY EARTHQUAKE REPAIRS										Log of Boring	
	Geotechnical Engineering		VARIOUS LOCATIONS ON HAWAII, UNIT 1										8	
		FEDERAL AID PROJECT NO. ER-15(19)												
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 190 *				
										Description				
Direct Shear									GW	8.5-inch ASPHALTIC CONCRETE				
	30				30		5		MH	9.5-inch BASE COURSE				
	39	78			15	2.5	10		MH	Brown SILTY CLAY with gravel, very stiff, moist (fill)				
							15			Brown CLAYEY SILT with traces of gravel and cobbles, stiff, moist (alluvium)				
	37				12	2.0	20			Brownish gray BOULDERS, COBBLES, AND GRAVEL with some silt, dense, moist (alluvium)				
				80			25							
				40			30							
				0	12		35		MH	Orange-brown CLAYEY SILT with remnant rock structure, stiff (saprolite)				
	56				8		40							
	83				10		45		ML	Orange to grayish brown SANDY SILT with some clay, stiff (saprolite)				
						50			Boring terminated at 30 feet					
						55								
						60								
						65								
						70								
						75								
Date Started:		February 5, 2009				Water Level: \pm		13.7 ft. 02/05/2009 1445 HRS						
Date Completed:		February 5, 2009				Drill Rig:		MOBILE B-53						
Logged By:		S. Latronic				Drilling Method:		4" Auger & HQ Coring						
Total Depth:		30 feet				Driving Energy:		140 lb. wt., 30 in. drop						
Work Order:		6125-00												





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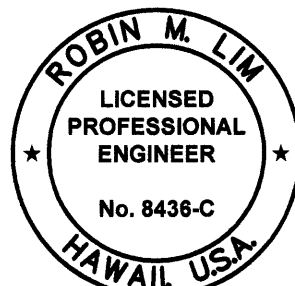
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SIGNATURE LIC. EXPIRATION
GEOLABS, INC.

STATE OF HAWAII	
DEPARTMENT OF TRANSPORTATION	
HIGHWAYS DIVISION	
BORING LOG - 4	
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS	
Various Locations on Hawai'i, Unit 1	
Federal Aid Project No. ER-15(19)	
Scale: AS NOTED	Date: December 18, 2009
SHEET No. 5 OF 7 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-15(19)	2009	57	59

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 9	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 190 *					
										Description					
	30				25				MH	8-inch ASPHALTIC CONCRETE					
	30	88			69				MH	Brown SILTY CLAY, very stiff, moist (fill)					
	33				22		5			Brown CLAYEY SILT, hard, moist (alluvium)					
										grades with some gravel and cobbles (basaltic)					
	33	69			76	1.3	10								
	37				30		15		MH	Orange-brown CLAYEY SILT with gravel (basaltic), very stiff, moist (residual soil)					
	64	50			14	2.0	20		ML	Orange-brown SANDY SILT with some clay, stiff (saprolite)					
	77	50			16	2.0	25								
	62				18		30			grades to very stiff					
										Boring terminated at 31.5 feet					
							35								
							40								
							45								
							50								
							55								
							60								
							65								
							70								
							75								
Date Started: February 4, 2009										Water Level: x 18.0 ft. 02/04/2009 1135 HRS					
Date Completed: February 4, 2009										21.5 ft. 02/04/2009 1410 HRS					
Logged By: S. Latronic										Drill Rig: MOBILE B-53					
Total Depth: 31.5 feet										Drilling Method: 4" Auger & HQ Coring					
Work Order: 6125-00										Driving Energy: 140 lb. wt., 30 in. drop					


		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAII, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 10	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 192 *					
										Description					
	35	86			37				GW	11-inch ASPHALTIC CONCRETE					
	33				30		5		MH	7-inch BASE COURSE					
										Brown CLAYEY SILT with gravel, very stiff, moist (alluvium)					
										Boring terminated at 5 feet					
							10								
							15								
							20								
							25								
							30								
							35								
							40								
							45								
							50								
							55								
							60								
							65								
							70								
							75								
Date Started: February 5, 2009										Water Level: x Not Encountered					
Date Completed: February 5, 2009															
Logged By: S. Latronic										Drill Rig: MOBILE B-53					
Total Depth: 5 feet										Drilling Method: 4" Casing & 4" Auger					
Work Order: 6125-00										Driving Energy: 140 lb. wt., 30 in. drop					





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CONSTRUCTION IS DEFINED IN CHAPTER 18-115, HAWAII
ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS,
ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS."
SIGNATURE: *[Signature]* 4/30/10
LIC. EXPIRATION
GEOLABS, INC.

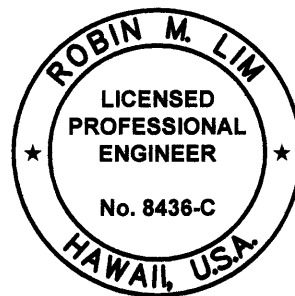
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<u>BORING LOG - 5</u>	
EMERGENCY EARTHQUAKE ROCKFALL REPAIRS	
Various Locations on Hawai'i, Unit 1	
Federal Aid Project No. ER-15(19)	
Scale: AS NOTED	Date: December 18, 2009
SHEET No. 6 OF 7 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-15(19)	2009	58	59

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAI'I, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 11	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation (feet MSL): 192 *					
										Description					
	40	74			44					8.5-inch ASPHALTIC CONCRETE					
	39				32		5			9.5-inch BASE COURSE					
										Brown CLAYEY SILT with gravel, very stiff, moist (fill)					
										Brown CLAYEY SILT with some gravel, stiff to very stiff, moist (alluvium)					
										Boring terminated at 5 feet					
Date Started: February 5, 2009												Water Level: \varnothing Not Encountered			
Date Completed: February 5, 2009															
Logged By: S. Latronic												Drill Rig: MOBILE B-53			
Total Depth: 5 feet												Drilling Method: 4" Casing & 4" Auger			
Work Order: 6125-00												Driving Energy: 140 lb. wt., 30 in. drop			

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAI'I, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 13	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A					
										Description					
	32	91			27					7-inch ASPHALTIC CONCRETE					
	36				25		5			5-inch BASE COURSE					
										Brown CLAYEY SILT with gravel, very stiff, moist (fill)					
										Boring terminated at 5 feet					
Date Started: February 5, 2009												Water Level: \varnothing Not Encountered			
Date Completed: February 5, 2009															
Logged By: S. Latronic												Drill Rig: MOBILE B-53			
Total Depth: 5 feet												Drilling Method: 4" Casing & 4" Auger			
Work Order: 6125-00												Driving Energy: 140 lb. wt., 30 in. drop			

		GEOLABS, INC. Geotechnical Engineering		EMERGENCY EARTHQUAKE REPAIRS VARIOUS LOCATIONS ON HAWAI'I, UNIT 1 FEDERAL AID PROJECT NO. ER-15(19)										Log of Boring 12	
Other Tests	Moisture Content (%)	Dry Unit Weight (pcf)	Core Recovery (%)	RQD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS	Approximate Ground Surface Elevation : N/A					
										Description					
	34	92			45					7-inch ASPHALTIC CONCRETE					
	31				9		5			10-inch BASE COURSE					
										Brown CLAYEY SILT with traces of gravel, very stiff, moist (fill)					
										Orange-brown CLAYEY SILT with traces of gravel, stiff, moist (alluvium)					
										Boring terminated at 5 feet					
Date Started: February 5, 2009												Water Level: \varnothing Not Encountered			
Date Completed: February 5, 2009															
Logged By: S. Latronic												Drill Rig: MOBILE B-53			
Total Depth: 5 feet												Drilling Method: 4" Casing & 4" Auger			
Work Order: 6125-00												Driving Energy: 140 lb. wt., 30 in. drop			



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SIGNATURE: *Robin M. Lim* EXPIRATION: 4/30/10
GEOLABS, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BORING LOG - 6

EMERGENCY EARTHQUAKE ROCKFALL REPAIRS
Various Locations on Hawai'i, Unit 1
Federal Aid Project No. ER-15(19)

Scale: AS NOTED Date: December 18, 2009
SHEET No. 7 OF 7 SHEETS